ENERGY NOTE

DON'T LOOK NOW BUT YOUR HOUSE MAY BE LEAKING

While you might enjoy a cool breeze wafting through the cracks in your house in the summer, you'll enjoy it less when you start to see your breath. That's when it's time to find those leaks and seal them.

Up to 40 percent of the average home's fuel bill pays to heat escaping air. Most homes experience air changes, drafty homes more so than well sealed houses. In each air change, warm inside air is replaced by cold outside air working its way through cracks, openings around doors and windows and other improperly sealed spots. To find and plug some of the leaks could translate into a 10 to 15 percent saving on fuel bills. Sealing leaks is probably the most cost-effective home energy conservation measure there is.

Armed with that incentive, how do you find the leaky culprits? One way is to hire an energy professional to conduct a home pressure test. In this test, windows and other openings are closed. The air inside the house is sucked out by a large fan placed in an open doorway. With the house depressurized, the drafty areas are easier to detect because the air swooshes in from the outside to fill the vacuum-like space.

Although that sounds interesting, a much simpler method is the do-it-yourself smoke test. Explore your house on a windy day with a burning stick of incense. Hold it in front of closed doors, windows, electrical outlets, baseboards and other potentially drafty spots. If the smoke wavers, seal the space. Candles and feathers work just as well, but the incense stick has the added benefit of perfuming your house while you work. These tests may not be as accurate as the pressure test, but they are effective and much cheaper.

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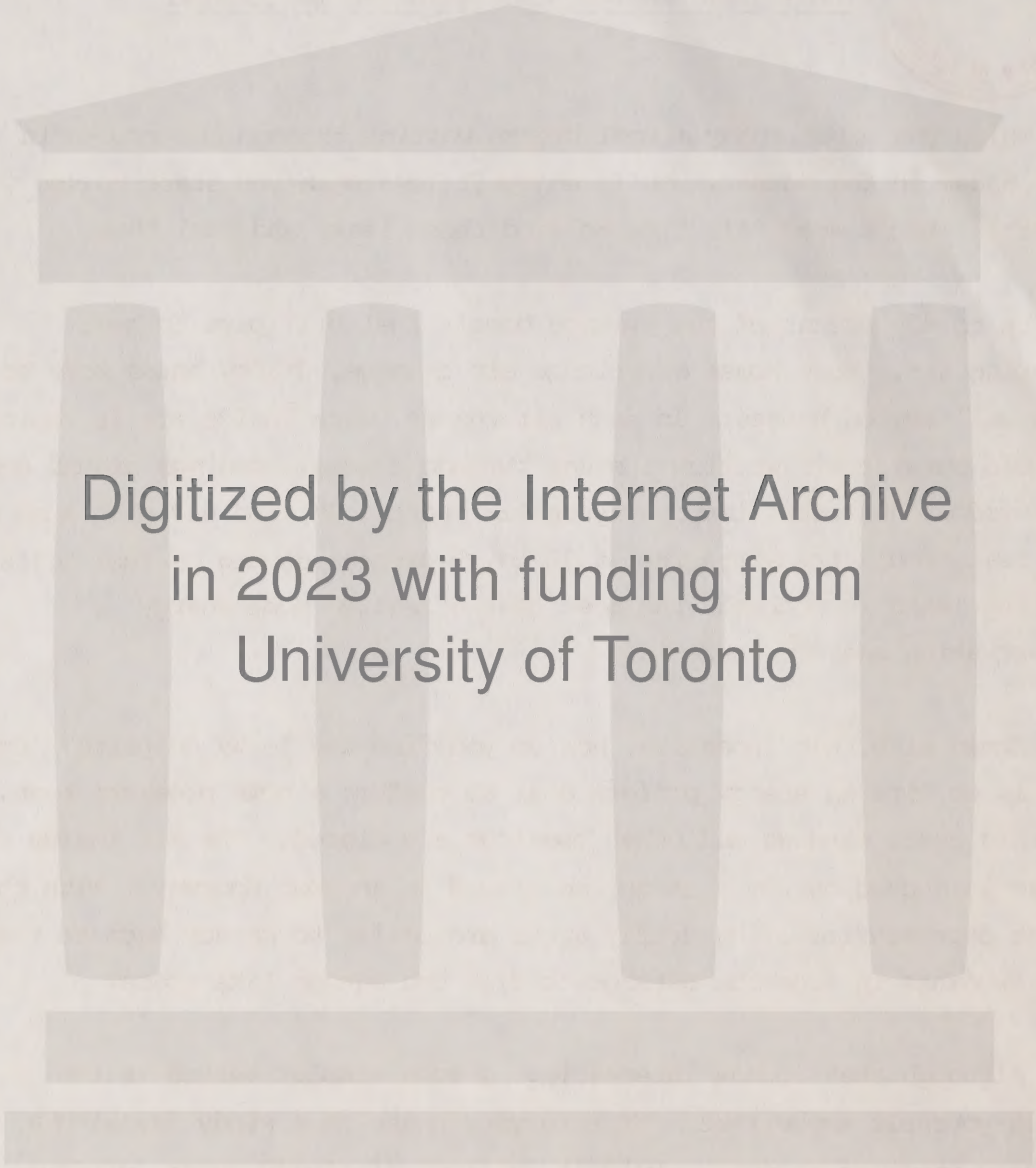

Once the leaks are found, it's time to caulk and weatherstrip. Caulking is used to fill fixed joints -- two surfaces that meet but do not move. This includes windowframes, doorsills, baseboards and plumbing holes. Caulking materials needed for the average house will cost about $80. Be sure to buy interior caulking; elastic brands are best -- silicone and butyl work well. An interior, acrylic latex caulking material comes in various colours for use around high visibility areas such as baseboards.

Weatherstripping helps reduce drafts in places with movable joints, two surfaces that meet and move relative to each other such as doors, windows, attic hatches, interior window shutters and so on. Weatherstripping keeps two surfaces snug against each other, keeping drafts from blowing through the joints.

Materials can be made of metal, plastic, vinyl or foam rubber. One effective, low cost product is a self-adhesive plastic V strip for doors and windows. The material should be rugged enough to withstand constant wear and tear. Depending on the number of exterior doors and windows, it will cost between $100 and $150 to weatherstrip the average house.

Most good quality caulking and weatherstripping materials are available at local hardware stores. Building supply stores that specialize in energy conservation carry a fuller line of products. For an average size house all the materials will rarely cost more than $250. As a general rule of thumb, a more durable product is worth the extra cost. Lower heating bills should repay the investment in the first year or two.

Set aside a weekend to do the work. The attic, usually a major heat loss area, is a good place to start. Locate the cracks in the attic floor and seal carefully with caulking material. The next most important area to work on is the basement. Be sure to look at the sillplate, where the house wall sits on the basement wall. Caulking this area can be tedious and messy but it is well worth the trouble. If the spaces at the end of the floor joists are exposed, they should also be insulated.

Door sweeps -- strips of pliable material to block the space between the floor and the bottom of the door -- plug a prime heat loss area.

Windows can account for as much as 25 percent of the heat loss in older homes, especially the old, double-hung variety. That's because the heat has so many places to escape from -- through the glass, through the joints between the glass and the frame, and through the joints between the window frame and the wall.

Weatherstripping and silicone seal can cut the leakage dramatically. Look for a good seal that will slightly increase the closing pressure of the window. To obtain a tight seal around the frame, carefully remove the interior moldings and caulk or poly foam the rough opening. Packing may be required for larger gaps. Bread bags work well.

Special gaskets are designed to seal out drafts behind electrical outlets. Seal all plumbing vents and electrical boxes with polyethylene sheets and caulking compound. Around the chimney use special heat resistant materials. Check exhaust fans to be sure the damper closes tightly and the vent is properly sealed.

Remember, you should seal your house before improving the insulation and not the other way around. Attic condensation can become a problem if extra insulation is added before air leaks are properly plugged.

The only other problem you're likely to have with a well sealed house is fitting all the energy gains into your pocketbook.

For further information, contact the Ontario Ministry of Energy, c/o GMS Box 37, Toronto, Ontario M7A 1M3.

ENERGY NOTE

SOME BURNING QUESTIONS ABOUT INSERTS

Lounging in front of the warm, golden glow of an open fireplace may become less appealing if you consider that as much as 25,000 cubic feet of warm household air is going up the chimney every hour. Worse, while the warm air is pouring out, cold air is leaking in through cracks throughout the house. More often than not, the overall effect of a cosy fire is to cool the space it serves.

There are alternatives though that stop short of blocking the fireplace off completely. A fireplace insert is one well worth investigating. Basically a small airtight stove, it is designed to fit into the existing hearth of a fireplace.

There is little doubt that installing an insert is definitely the best way to improve a fireplace's performance. Not everyone agrees, however, that it is worth the $1,000 to $1,400 investment, particularly when possible fire hazards are added into the equation. What follows is a rundown on what inserts will and won't do as well as some guidelines for fire safety, to help you make an informed choice.

Supplementing Your Heating System

The first thing to remember about inserts is that, unlike large wood stoves, they are generally not meant to replace a home's heating system. Still, the more than 600,000 Ontario householders who are burning wood in fireplaces could gain a major source of supplementary heat by retrofitting with inserts.

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The appeal of an insert is its efficiency. Consider this: if efficiency is the percentage of the total energy available in the wood that becomes useful heat for your home, then open fireplaces have efficiencies of minus 10 to plus 10 per cent. Fireplace inserts, on the other hand, can achieve efficiencies of between 20 to 45 per cent.

Why is an insert so much more efficient than an open fireplace? The insert makes the most of the heating effect from burning wood. With an insert the heating effect is not cancelled out by the exodus of heated room air through an open fireplace, up the chimney.

Also, most inserts are designed for controlled combustion. This means that the flow of air into the combustion chamber is regulated almost exclusively by controls such as screw-on draft caps. Through precise regulation of combustion air, more complete combustion of the wood is possible, making for greater efficiency. To get the most heat possible into the room, the insert should also be equipped with double walls and circulating fans.

Aside from a strong performance, another thing going for the insert is a "snazzy" appearance and relatively easy installation. Unlike large wood stoves, inserts don't take up floor space and don't usually require as much structural modification. They are easily fitted into the existing fireplace cavity.

That's the up side. On the down side is the nagging worry about chimney fires, more common since the boom in sales of household wood stoves. Although not necessarily implicating inserts, the increase in chimney fires does prove that fire safety must be taken seriously. Two areas of concern associated with fireplace inserts are creosote build-up in the chimney and overheating of the fireplace cavity.

Creosote is a black, tarry, flammable deposit caused when woodsmoke vapours condense on the relatively cool inside surface of a chimney. A creosote build-up is almost inevitable, but it can become a real problem with the kinds of low temperature fires possible in controlled combustion inserts.

The second concern, overheating the fireplace cavity, can lead to fire in the frame of the house. Inserts radiate heat in all directions, so the back wall of the fireplace can become very hot, especially since there is no longer cooling room air sweeping over the fireplace walls as with open fireplaces.

Knowing the hazards means that the risks can be minimized. Keeping the fire burning briskly with dry, well seasoned wood will minimize creosote build-up. A monthly check for creosote deposits in the chimney and more often in spring and fall when fires burn at a lower temperature will help to avoid a dangerous build-up.

Though it might be tempting to put off cleaning -- inserts are extremely heavy to move -- don't. Any creosote build-up is a fire hazard. Shop for inserts designed for easy removal for chimney cleaning.

Also look for inserts with an insulated outer skin to minimize heat transfer through the rear walls of the insert to the back of the fireplace cavity.

Have the Installation Inspected

Always obtain a building permit before installing an insert and ensure that inspections are performed during installation by either the fire department or a building inspector (depending on the municipality). A qualified chimney sweep should also check the condition of the chimney and ensure that the flue tile liners are in good repair.

A qualified installer will do the job properly, providing a tight or direct connection to the existing chimney flue, known as a positive connection. This installation technique ensures that any creosote dripping back down the chimney will fall harmlessly into the combustion chamber where it will burn safely, rather than seeping around the back of the insert in the fireplace cavity.

You could also have the entire chimney relined with a flexible stainless steel liner, connected directly to the appliance. Installation charges should be less than with free-standing stoves because the chimney is already in place. The liner should improve the draft characteristics of the insert since it will be sized to match its flue outlet.

As with the purchase of any major appliance, shop around before you buy a fireplace insert, and check warranties and certification to ensure that the insert is approved by a recognized testing agency such as Canadian Standards Association (CSA), Underwriters Laboratories of Canada (ULC) or Warnock Hersey Professional Services (WH).

And last but not least, enjoy it. Fireplace inserts are an elegant, sensible way to enjoy a fire by burning just wood, and not money too.

For further information, contact the Ontario Ministry of Energy, c/o GMS Box 37, Toronto, Ontario M7A 1M3.

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ENERGY NOTE

HOW DO YOU SCORE?

THE DOLLARS AND SENSE OF ENERGY-SAVING.

SOME ENERGY-SAVING MEASURES ARE MORE COST-EFFECTIVE THAN OTHERS. THIS QUIZ TESTS YOUR SKILL AS A COST-WISE ENERGY CONSERVER.

EVERY 'YES' GETS A SCORE BUT YOU EARN BONUS POINTS FOR ENERGY-SAVERS THAT COST THE LEAST AND SAVE THE MOST. TALLY UP YOUR SCORE AND SEE HOW YOU RATE.

Have you sought free advice on home energy conservation?	05	If not, you're missing a good chance. Contact the Ontario Ministry of Energy.
Given your house the "feather" test to find major draughts?	05	Excellent. Air leakage causes about 1/3 of heat loss in most homes.
Plugged air leaks by putting inexpensive foam gaskets behind electrical plates on outside walls?	10	Gold star! These gaskets only cost about 20 cents. Such simple low-cost measures should be done before you insulate.
Weather-stripped doors and windows?	05	A wise move. For very little expense, this can save a lot.
Caulked around windows?	05	More good value for little money.
Added storm windows or upgraded to double or triple-glazed windows?	05	Expensive. Payback varies. If you bought better windows but didn't seal and weatherstrip, you may be throwing money out the window -- forfeit score!
Sealed air leaks around the mail slot?	10	Energy savings may not be worth a 10, but your attention to detail is outstanding. Score 10!

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Lowered the thermostat?	10	You can't beat this cost-free measure for cost-effectiveness. Cutting back a few degrees can cut fuel bills 10 - 15%.
Upgraded insulation?	05	More expensive and less cost-effective than plugging air leaks but it can reduce heat loss.
If you've insulated, where?		
Basement?	10	Best value for your insulating dollar. Basements are the main source of heat loss in most homes.
Attic?	07	Attics are the second.
Walls?	03	This costly job may not be cost-effective unless the walls are totally uninsulated.
Considered up-grading the efficiency of your existing furnace?	05	If not, you should consult experts at the Ministry of Energy to help you assess the pay-back period.
Considered buying a new high-efficiency furnace?	05	This purchase may not be economic unless your old furnace is worn out, however you deserve 5 points if you've analyzed the pay-back.
Cleaned your furnace filters in the past month? Or, bled the air from hot water radiators in the past two months?	10	Clogged filters can reduce heating efficiency by up to 25%. Air trapped in radiators reduces efficiency of your heat distribution system.

RATING

75 - 100	Excellent. Your prize is greater home comfort and lower energy costs.
50 - 75	Fair. You could benefit from free energy-saving advice. Consult the Ontario Ministry of Energy.
Under 50	Poor. Advisors at the Ontario Ministry of Energy can help you get the best pay-back for your energy-saving dollar.

If you'd like more detailed information, talk to a Ministry of Energy advisor today. Or, if you don't have time for a consultation today, phone the Ministry anytime at 965-3246 or Zenith 1-800-80420.

ENERGY NOTE 24

BURSTING THE BALLOON ON ENERGY CONSERVATION MYTHS

Sometimes the people with the best intentions make the worst mistakes. Energy efficiency around the home is one area where good intentions can go a long way to reducing energy bills. Sometimes, though, those good intentions are based on myths and misconceptions about energy conservation. These straightforward answers below will set the record straight on some home energy efficiency myths.

1) Turning a fluorescent light on and off wastes more energy than leaving it on all day.

A widely held belief about fluorescent lights surrounds the energy used in turning the lights on and off; that fluorescent lights must be turned off for at least half an hour before the energy saved equals the energy used to energize it in the first place. People argue that you should not turn off the lights when leaving a room for short periods.

In fact it takes less than a second for a turned off fluorescent light to save the amount of energy required to turn it on again. As a general rule, if fluorescent lights are not going to be needed for five minutes or more, switch them off.

Ontario Ministry of Energy
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2) Turning the hot water heater off at night is a valuable energy saving habit.

It is more practical to maintain the hot water tank at a set temperature than to reheat it every day. There are simpler more efficient ways to save energy and dollars. One simple alternative is to lower the temperature setting on the heater. This alone can result in energy savings of five to 20 percent, depending on the temperature drop. A fixed setting of 43^0C should result in notable savings. Some people keep the setting as low as 38^0C, but that's a matter of personal comfort. Remember, though, that a dishwasher requires a higher water temperature setting to be effective.

Insulating the heater and the piping is another realistic way to save energy and money, especially if the water tank is located in an unheated space such as a cold basement.

There are two types of heater insulation. One is a simple to install tank blanket; the other is strip insulation. Either are appropriate for gas and oil-fired heaters but controls, junction boxes, air inlets and the top and bottom of the tank should be left free of insulation. Covering a gas or oil-fired heater's control box is dangerous and a fire hazard.

Insulating an electric heater without first having it inspected by a utility representative is not recommended. If you are renting an electric heater, the utility may install a blanket for you.

You can buy hot water tank insulation in most hardware or building supply stores and prices vary from approximatey $25 to $50, while R-values vary from RSI 1.05 (R-6) to RSI 1.76 (R-10). The higher the R-value, the lower the heat loss. Energy savings with an insulation blanket or strip insulation can range from five to 15 percent for a gas or oil-fired water heater and a little less for an electric water heater. The payback period for the insulation depends on the percentage of heat savings and the price of the insulation.

3) Insulated shutters and blinds are too expensive to make the energy savings worthwhile.

Custom made insulating shutters and blinds can be expensive, but there are many cheaper, do-it-yourself varieties. Some shutter kits, for instance, cost less than $20. An even cheaper solution to the expensive shutter is a removeable foam board pop-in, cut to the size of the window and weatherstripped along the edge for a tight fit.

Insulated curtains need be no more than in-place heavy curtains sealed tightly to the wall and window sill with special tape. Or sew in energy savings the next time you make curtains by adding a layer of insulating material between the fabric and the backing. Insulation values can range from a high of RSI 1.25 (R-7) for a well-made shutter to RSI .19 (R-1) for insulating drapes.

4) To be cost effective and keep out cold winter drafts, insulating shutters and blinds should be closed day and night.

Interior window insulation helps stop warm household air from seeping into the night air, but it should always be opened or removed during the day, for two important reasons. In the first place, uncovered windows on all but northern exposures take advantage of passive solar gain during daylight hours, allowing the sun's heat to warm the house. Second, when the blinds or shutters are left closed day and night, there is a danger of heat build-up between the glass and the window covering. The windows may overheat, sometimes stressing the glass to the breaking point.

5) Keeping a furnace fan running continuously during winter months creates cold drafts and wastes more electricity than it saves in home heating fuel.

The answer to this statement is not quite as cut and dried as the others. Expert opinions vary, but for the most part keeping the fans running on low makes sense. Here's why.

Furnace fans continually recirculate room air through the ducting and the furnace, spreading heat evenly throughout the house.

Energy savings result because the continuous air circulation not only extracts more of the heat produced by the furnace, it also makes efficient use of trapped household heat from such localized sources as lighting, cooking, laundry, showering and solar heat. Instead of being left to overheat certain rooms, warm air is evenly distributed throughout the house, raising the general temperature. The end result is that the furnace turns on less often and the homeowner saves fuel.

The added electricity cost to run the fan continuously is about $3.30 per month, or less than $25 for the heating season, a cost that will likely be recovered in fuel savings. People sometimes complain of cool drafts from the fans but that is simply because room temperature air in motion feels cooler; in fact it isn't. But let your comfort be your guide.

There are many misunderstandings that cloud the road to energy efficiency. The next time you hear a fool proof way to save energy, back it up with an expert opinion from the Ontario Ministry of Energy. Better to be energy sure than energy poor.

For further information, contact the Ontario Ministry of Energy, c/o GMS Box 37, Toronto, Ontario M7A 1M3.

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Energy Note

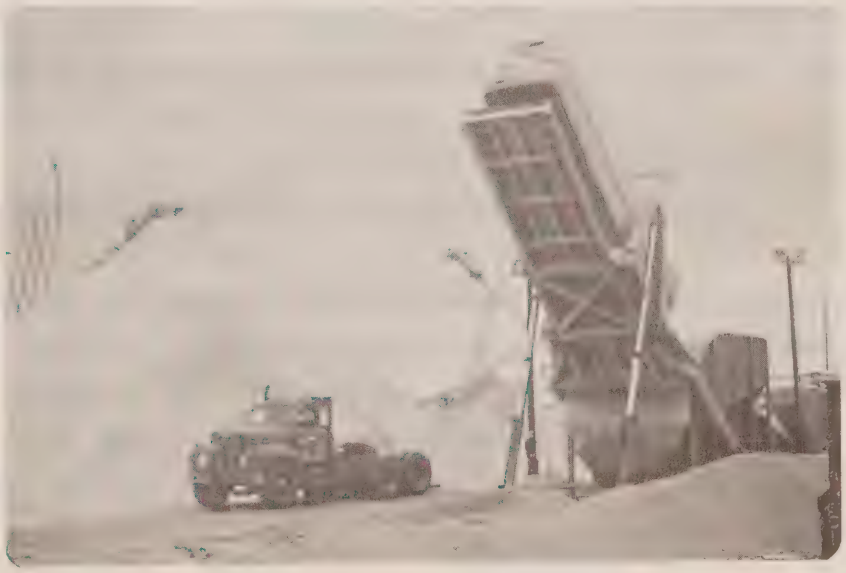
Ministry of Energy Ontario

ENERGY FROM WOOD: A STATUS REPORT, JUNE 1984

Wood is an important energy source in Ontario. Today's energy costs have improved the economic feasibility of wood fuel for Ontario industries, businesses, institutions, farms, and homes. As well, Ontario is well-endowed with wood and wood waste.

The forestry industry and other wood processing industries produce millions of tonnes of wood residue a year. Logging operations leave stumps, branches and tree tops on the forest floor. Processing mills burn or dump over a million tonnes of wood residue a year.

Currently available wood energy systems can convert wood or wood residue to hot air, steam, electricity or "wood gas", a possible substitute for natural gas. In fact, Ontario pulp and paper mills now rely on wood residue for about 40 per cent of their energy needs.



BARK AND SAWDUST -- WOOD RESIDUE HAS BECOME AN IMPORTANT ENERGY SOURCE FOR ONTARIO

Energy Ontario

In addition to the primary wood processing industries, secondary wood industries in the Golden Horseshoe area alone produce more than 160,000 tonnes a year which represents a disposal cost for these industries. Energy recovery can represent a viable option for using this waste.

MINISTRY OF ENERGY POLICY

The Ministry of Energy supports wood energy projects as part of the Ontario government's commitment to reduce oil consumption, increase energy self-reliance, and recover resource values in waste. By 1995, the Ministry aims to boost the amount of Ontario-produced energy from its current portion of 25 per cent to 37.5 per cent.

By 1995, the Ministry expects waste and biomass to supply 4 per cent of Ontario's energy needs -- a big jump from the current 1 per cent. Although some will be supplied by municipal solid waste and agricultural resources and waste, wood and wood residue are expected to supply half the amount, or 2 per cent of Ontario's energy needs.

By 1995, wood energy is projected to supply the energy equivalent of 15 million barrels of oil -- enough to heat 750,000 homes. One million barrels of oil equivalent (BOE) can heat nearly 50,000 homes for a year.

WOOD ENERGY PROJECTS SUPPORTED BY MINISTRY OF ENERGY

The Ministry of Energy supports wood energy projects in two key areas: re-use of wood residue and cultivation of hybrid poplar tree farms. The following projects have received some assistance from the Ontario government. See Appendix I for more detailed statistical information.

BioShell, a subsidiary of Shell Canada, turns sawmill residue into compressed wood pellets called Energex fuel pellets. Plants in Iroquois Falls and Hearst can produce 200,000 tonnes of pellets a year. Much is used by Abitibi-Price to fuel industrial boilers.

Grenville Christian College, a private school in Brockville, uses a wood-burning system to provide hot water and space heating. The system, installed in 1982, burns sawdust, wood chips and bark from nearby mills. In 1982/83, it cut heating costs from $100,000 to $25,000.

Kakabeka Timber Limited, a sawmill near Thunder Bay, uses sawdust and wood chips to fuel a dry kiln formerly fired by propane. The system saves about $70,000 a year in fuel costs.

Foothill Greenhouses Ltd., in the Holland Marsh area, uses a sawdust-burning system to heat a greenhouse complex producing cucumbers. Installed in 1982, the system reduces energy costs by about $40,000 a year.

Jim Vonk's greenhouse, also in the Holland March area, demonstrates another system which uses wood waste to replace oil. It is expected to save $14,000 a year.

David Smith, a farmer in Port Ryerse, has a small scale system which burns sawdust, corn cobs, peanut shells, and other waste to fire a 60-horsepower, restored locomotive boiler. The boiler provides heat to dry grain and heat a small greenhouse growing tomatoes. Much of the system was built with used parts.

Hillcrest High School in Thunder Bay was Ontario's first public school to switch from natural gas to waste wood fuel. The system, costing $263,000, is expected to pay for itself by 1990 and save $500,000 in fuel costs during its lifetime. Scrap wood is supplied by a local lumber and planing mill.

Kingsway College, in Oshawa, installed a system in early 1984 which cost $1.3 million and is expected to reduce heating costs by $100,000 a year. The cost-free fuel comes from the college's furniture factory which produces more than 2,000 tonnes of scrap wood a year. The scrap can produce the energy equivalent of 4,800 barrels of crude oil, enough to provide hot water and heating for all 44 buildings on the 98-hectare campus.

RESIDENTIAL WOOD ENERGY PROJECTS

Estimates show that 800,000, or 25 per cent of the homes in Ontario, now rely on wood as a primary or secondary energy source. Last year, at least 9,000 homeowners converted to wood heat.

Near Dorset, Ontario, the Leslie M. Frost Natural Resources Centre demonstrates three different wood-fired central heating systems in homes originally heated by oil. Monitoring has provided valuable data on relative performance and cost-effectiveness.

In Minden, Ontario, the Ministry of Energy and Canadian Solifuels Inc. have a cost-sharing agreement to demonstrate a wood pellet delivery system. CSI will provide bulk storage facilities, develop an automatic metering system on a home delivery truck, and install wood pellet furnaces in several homes as a replacement for oil heat.

A similar project, involving the demonstation of 5 wood pellet furnaces in northern Ontario, is being conducted by J. Hince Dist. of Hearst.

The Ministry of Energy convened an interministry/industry task force on residential wood heat safety. It is reviewing present procedures for monitoring the safety of residential wood heating installations and exploring various options for addressing fire safety concerns such as the training of installers and chimney sweeps and a comprehensive consumer education program. The task force will report to the Ministry of Energy in the fall of 1984 with recommendations for a comprehensive administrative plan to improve and regulate wood heat safety.

WOOD ENERGY STUDIES SUPPORTED BY MINISTRY OF ENERGY

Studies are underway to determine the potential for viable energy projects in the following areas: Canada Starch in Cardinal, the Rideau Regional Centre in Smiths Falls, the Kemptville Agricultural College in Kemptville, the Ministry of Natural Resources Nursery in Kemptville, Procter & Gamble in Hamilton, Cities Heating in London, and Grant Waferboard in Englehart.

Hybrid poplar plantations are an important future energy source. New varieties have short harvest cycles of two to ten years; one hectare can produce more than 17 green tonnes of wood a year. To develop hybrids with higher energy content, the Ministry of Energy funds research in genetic breeding at the Ministry of Natural Resources Ontario Tree Improvement and Forest Biomass Institute in Maple, Ontario.

The Chapleau District Heating study concluded that excess steam heat produced by the burning of sawmill residue can be used to heat part of a nearby community and generate marketable electricity. It could be economically feasible to build a pipeline network to carry the heat to several commercial and institutional buildings in the community of Chapleau. Private sector proposals for implementation are currently being developed.

GOVERNMENT ASSISTANCE AVAILABLE

FEDERAL FUNDING: Federal tax incentives are available under Class 34 of the Capital Cost Allowance provision and the FIRE program provides grant assistance of up to 20 per cent of the cost of eligible equipment. Additional funding may be available from EnerDemo, a federal program to support new technologies to conserve energy and use renewable energy.

For the residential sector, the federal Canada Oil Substitution Program provides taxable grants of up to $800 to assist the installation of approved wood heating systems by homeowners who convert from oil.

PROVINCIAL FUNDING: The Ministry of Energy will share the risk of demonstration projects, the costs of technical and economic feasibility studies, and the capital costs of installing new systems which use a new technology or a new application of a proven technology. Recipients of funding participate in a monitoring and information transfer program designed to evaluate performance and stimulate further applications.

MORE INFORMATION

Immediate and long-term potential for energy from waste and biomass are outlined in the Ministry of Energy publication, Energy from Waste: A Program for Ontario, published in March 1980.

More information is available from the Forest Resources Unit, Energy from Waste/Biomass Section, Ontario Ministry of Energy, 56 Wellesley Street West, 10th Floor, Toronto, Ontario, M7A 2B7. Telephone: (416) 965-8059.

Appendix I

ONTARIO WOOD ENERGY PROJECTS

PROJECT/START-UP DATE FEEDSTOCK/ENERGY PRODUCT	CAPACITY TONNES/YEAR	OIL REPLACED BBL/Year	CAPITAL COST $000's
Constructed			
Shell Woodex/1980 Wood/Solid Fuel	225,000	265,000	4,500
Grenville College/1982 Wood/Hot Water	1,400	2,000	350
Kakabeka Timber/1982 Dry Wood/Hot Air	1,100	2,000	180
Foothill Greenhouses/1982 Dry Wood/Steam	1,000	2,000	180
Hillcrest High School/1983 Green Wood/Steam	1,700	1,900	263
Kingsway College/1984 Dry Wood/Steam	2,100	3,000	1,300
L.M. Frost Centre/1984 Wood/Hot Air	30	60	50
Minden Furnaces/1984 Wood Pellets/Hot Air	20	60	100
Hearst Furnaces/1984 Wood Pellets/Hot Air	40	120	80
Under Study			
Canada Starch/est.1986 Green Wood/Steam+ELect.	260,000	286,000	14,500 (Approx.)
Rideau R.C./est.1986 Green Wood/Steam	24,000	26,000	1,700
Kemptville Ag.Col./est.1986 Dry Wood/Steam	4,500	5,000	700
Chapleau/est.1986 Wood/Steam+Elect.	100,000	110,000	7,500
Procter & Gamble/est.1986 Wood/Steam	100,000	110,000	8,000 (Approx.)
London/est.1986 Sawdust/Steam	30,000	75,000	unavailable
Grant Waferboard/est.1986 Sanderdust/Steam	25,000	65,000	2,000

Energy Note

Ministry of Energy Ontario

R-2000 BUILDERS IN ONTARIO

These builders have been selected to build low energy homes to the R-2000 standard.

The Ontario Ministry of Energy and HUDAC (under the Affordable Low Energy New Housing Program) or the federal department of Energy, Mines and Resources and HUDAC (under the Super Energy Efficient Home Program) have supported these R-2000 builders.

TORONTO AREA

*Monarch Construction
2025 Sheppard Ave. East
Suite 1201
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Office: 416 491-7440
Mr. Keith Blair

*H. Kassinger Construction Ltd.
500 Mayfair Avenue
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Office: 416 728-7583
Mr. Alex Hillebrand

J.D.S. Investments Ltd.
1000 Finch Ave. West.
Ste. 800
Downsview, Ontario
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Office: 416 833-8400
Mr. Don Manson

Kingbrook Inc.
P.O. Box 59
22 Fisher St.
King City, Ontario
L0G 1K0

Office: 416 833-5803
Mr. James C. Gelleney

Skourides Construction
370 Dundas St. East
Toronto, Ontario
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Office: 416 921-8948
Mr. Alex Skourides

*Participants in the Ontario Ministry of Energy Affordable Low Energy New Housing Program.

Energy Ontario

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M5T 2G6
Office: 416 598-2811
Mr. E. Goldstein

Gardi Homes Ltd.
85 Irondale Dr.
Weston, Ontario
M9L 2S6
Office: 416 745-6422
Mr. M. Patton

CENTRAL REGION

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Mr. Barry Green

Glen Watson Construction Ltd.
R.R. No. 2
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K9J 6X3
Office: 705 745-0078
Mr. Glen Watson

Arne Wallin 269367 Ont. Ltd.
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L4M 4S6
Office: 705 726-0760
Mr. Arne Wallin

Johnson-Coulter & Assoc. Inc.
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Office: 613 542-5981
Mr. Ernest Howlett

Gordon Tobey Dev. Ltd.
211 Prince Edward St.
R.R. No. 3
Brighton, Ontario
K0K 1H0
Office: 613 475-0618
Mr. Gordon E. Tobey

Lewis Solar Research
174 Ann Street
Belleville, Ontario
K8N 1N9
Office: 416 469-1391
Mr. Lawrence Lewis

WEST-CENTRAL REGION

Seaman & Sons Custom Bldr's No. 2
P.O. Box 414
Southampton, Ontario
N1H 2L0
Office: 519 797-3824
Mr. R.A. Seaman

Corjan Construction
P.O. Box 59
Chatsworth, Ontario
N0H 1G0
Office: 519 794-3869
Mr. Al Lunshof

*Dunmill Construction Ltd.
44 Hyland Road
Guelph, Ontario
N1E 1T3
Office: 519 821-7960
Mr. John Dunnink

James Hill Construction
P.O. Box 167
Lion's Head, Ontario
N0H 1W0
Office: 519 793-3325
Mr. Douglas Hill

O.C. Long Construction
Box 1419
Port Elgin, Ontario
N0H 2C0
Office: 519 832-9814
Mr. Clayton Long

Wilson Schwindt & Sons. Bldg.
Const. Ltd.
137 Elgin Street
Mount Forest, Ontario
N0G 2L0
Office: 519 323-1056
Mr. Schwindt

W. Clarke Ferguson Ltd.
R.R. No. 1
Kincardine, Ontario
N0G 2G9
Office: 519 395-5454
Mr. Clarke Ferguson

Royal Homes Ltd.
Box 730, Arthur St.
Wingham, Ontario
N0G 2W0
Office: 519 357-2606
Mr. Douglas Kuyvenhoven

James A. Smith
Construction & Design
116 Woodbend Cres.
Waterloo, Ontario
N2T 1G9
Office: 519 888-6404
Mr. James A. Smith

George Milla Const. Ltd.
64 Walnut Drive
Guelph, Ontario
N1E 4B5
Office: 519 822-7520
Mr. Donald Hunter

Carl G. Reinhardt Limited
R.R. No. 2
Teeswater, Ontario
N0G 2S0
Office: 519 392-6491

EASTERN REGION

*City of Ottawa - Non Profit
Housing Corporation
214 Hopewell Avenue
Ottawa, Ontario
K1S 2Z5
Office: 613 563-3441
Ms. Judy Forrest

*Menard Bros. Limited
P.O. Box 38
1100 Marleau Street
Cornwall, Ontario
K6H 5R9
Office: 613 932-7686
Mr. Guy L. Menard

*Paul Veenstra Construction
P.O. Box 825
Brockville, Ontario
K6V 5W1
Office: 613 342-5200
Mr. Mike Veenstra

*The Sunwrights
205 Pretoria Avenue
Ottawa, Ontario
K1S 1X1
Office: 613 234-2427
Mr. Jonathan Cloud

Tartan Homes Ltd.
331 Cooper St.
3rd Floor Room 300
Ottawa, Ontario
K2P 0G5
Office: 613 238-2040
Mr. Bill McLean

Thomas C. Assaly Corp. Ltd.
900 Dynes Road
Ottawa, Ontario
K2C 3L6
Office: 613 727-0378
Mr. P.S. Rothwell

Sidney Vandermeulen
6 Belevedere Place
Brockville, Ontario
K6V 3A4
Office: 705 726-0760
Mr. Sidney Vandermeulen

Solterra Developments Ltd.
1355 Wellington St.
Ottawa, Ontario
K1Y 3C2
Office: 613 729-3116
Mr. L. Schmidt

J & J Contracting Ltd.
27 Elizabeth St. Box 143
Osgoode, Ontario
K0A 2W0
Office: 416 826-2883
Mr. John Berkers

Bruce Grant Const. Ltd.
615 Pitt St.
Cornwall, Ontario
K6J 3R8
Office: 613 938-8004
Mr. D. Bruce Grant

Dave Huckabone Const. Ltd.
R.R. No. 1
Cobden, Ontario
K0J 1K0
Office: 613 646-7609
Mr. David H. Huckabone

Earl E. Covell
General Contracting Ltd.
R.R. No. 1
Lombardy, Ontario
K0G 1L0
Office: 613 283-4268
Mr. Earl E. Covell

NIAGARA REGION

*Group 2 Development Ltd.
3643 Portage Road
Niagara Falls, Ontario
L2J 2K8
Office: 416 354-2711
Mr. Grant Minard

*Lifestyle Homes
P.O. Box 483
Niagara-on-the-Lake, Ont.
L0S 1J0
Office: 416 682-0638
416 688-0884
Mr. Frank Grimshaw

*Peter Phelps & Assoc. Ltd.
13A Livingston Avenue
Grimbsy, Ontario
L3M 1K6
Office:
Mr. Paul Phelps

*Starward Homes Ltd.
152 Hester Street
Hamilton, Ontario
L9A 2N8
Office: 416 385-3271
Mr. Jan Szostak

*Pelham Const. Ltd.
P.O. Box 722
Fonthill, Ontario
L0S 1E0
Office: 416 892-3902
Mr. John Wiens

Roma Const. (Niagara) Ltd.
26 Meadowbrook Cres.
St. Catharines, Ontario
L2M 7H1
Office: 416 935-2733
Mr. Giuseppe Perlingieri

Lifestyle Homes
P.O. Box 483
Niagara-on-the-Lake, Ont.
L0S 1J0
Office: 416 688-0884
Mr. Frank Grimshaw

Marcus Klein Construction
6279 Huggins St.
Niagara Falls, Ontario
L2J 1H2
Office: 416 534-0552
Mr. Marcus Klein

Lester Shoalts Ltd.
214 West St.
Port Colborne, Ontario
L3K 4E3
Office: 416 835-2177
Mr. Lestor Shoalts

Kenmore Construction Ltd.
P.O. Box 333
St. Catharines, Ontario
L2R 6T7
Office: 416 684-2317
Mr. James A. Kaufman

Group 2 Development
3643 Portage Rd.
Niagara Falls, Ontario
L2J 2K8
Office: 416 354-2711
Mr. Grant Minard

George Schneider Const. Co. Ltd.
2796 Solar Cres.
Niagara Falls, Ontario
L2J 4A8
Office: 416 354-4984
Mr. George Schneider

Grant Anger Construction
P.O. Box 75
Fonthill, Ontario
L0S 1E0
Office: 416 892-6276

SOUTH WESTERN REGION

*Scope Construction
74 Amelia Street
Chatham, Ontario
N7L 2B8
Office: 519 354-3600
(messages)
Mr. Abe De Jong

*Mangro Homes Ltd.
R.R. No. 7
Aylmer, Ontario
N5H 2R6
Office: 519 773-5870
631-9420
Mr. Jack Groot

*Earth Sheltered Projects
R.R. No. 1
Dorchester, Ontario
N0L 1G0
Office: 519 268-3424
Mr. O. Hiemstra

*MacKay General Contractor
P.O. Box 122
Paris, Ontario
N3L 3E7
Office: 519 442-2742
Mr. Ken MacKay

Don Ward Homes Inc.
P.O. Box 220
Glencoe, Ontario
N0L 1M0
Office: 519 287-3832
Mr. Don Ward

Ross F. Hoover & Son Const. Ltd.
22 King St.
Mt. Brydges, Ontario
N0L 1W0
Office: 519 264-1651
Mr. Ross F. Hoover

Extra Realty Ltd.
Box 7225, Postal Station E
London, Ontario
N5Y 4X5
Office: 519 679-9794
Mr. Peter Sergautis

Bouma Construction Ltd.
49 Cecile Avenue
Chatham, Ontario
N7M 5S2
Office: 519 352-6804
Mr. Ray Buoma

Frank Lutsch Const. Ltd.
4 Lutsch Avenue
Leamington, Ontario
N8H 4B9
Office: 519 326-3557
Mr. Nick Lutsch

Joseph J. Naus
268 Ellor St.
Strathroy, Ontario
N7G 2L4
Office: 519 433-1757
Mr. R.P. Jansen

Leftbrook Const. Ltd.
239 Lisgar Avenue
Tillsonburg, Ontario
N4G 4N3
Office: 519 842-8080
Mr. George Balpataky

Kramer Construction
533 696 Ont. Ltd.
69 Inkerman St.
Ingersoll, Ontario
N5C 1N7
Office: 519 485-4081
Mr. Andy Kramer

MacKay General Contractor
P.O. Box 122
Paris, Ontario
N3L 3E7
Office: 519 442-2742
Mr. Ken MacKay

P & A Stigter Const. Ltd.
R.R. No. 4
Brantford, Ontario
N3T 5L7
Office: 519 449-2982
Mr. Aris Stigter

Wellington Brothers Const.
P.O. Box 76
Forest, Ontario
N0N 0J0
Office: 519 873-2934
Mr. V. Wellington

R.C. Pruefer Co. Ltd.
P.O. Box 3130
Windsor, Ontario
N8N 2M3
Office: 519 727-6511
Mr. Jerry Vernhout

Rebcon Associates Ltd.
550 Talbot St.
St. Thomas, Ontario
N5P 1C4
Office: 519 631-6064
Mr. R.E. Brooks

R.S. Trumper Construction
1335 Oxford St. West
London, Ontario
N6H 1V9
Office: 519 472-8168
Mr. R.S. Trumper

Vanderheide Construction
996 Alder Cres.
Sarnia, Ontario
N7S 3G2
Office: 519 542-4842
Mr. John Vanderheide

Tony Santos Const. Ltd.
P.O. Box 183
R.R. No. 2
West Lorne, Ontario
N0L 2P0
Office: 519 768-1792

Gulf Homes
189 Lesperance Rd.
Windsor, Ontario
N8N 1Y4
Office: 519 735-3395
Mr. John Kopock

Kolody Contracting Co. Ltd.
R.R. No. 1
Tecumseh, Ontario
N8N 2L9
Office: 519 735-7532
Mr. N. Kolody

NORTH WESTERN REGION

S. Lotysz & Sons Const. Ltd.
2613 Rankin St.
Thunder Bay, Ontario
P7E 6A3
Office: 807 623-2638
Mr. John Lotysz

Northern Contracting Ltd.
2078 Broadway Ave. Vickers Hts
Thunder Bay, Ontario
P0T 2Z0
Office: 807 475-4359
Mr. Steven Syme

K.E.S. Construction Ltd.
P.O. Box 414
Drayton Rd.
Sioux Lookout, Ontario
P0V 2T0
Office: 807 737-1622
Mr. Klaus Schultz

NORTHERN REGION

*County Contracting
23 Perini Road
Elliot Lake, Ontario
P5A 2T1
Office: 705 848-3121
Mr. Ken Davis

*Dalron Homes
667 St. Clair Street
Sudbury, Ontario
P3E 4G9
Office: 705 673-8686
Mr. Dave Arnold

Flowerhill Ltd.
P.O. Box 487
Sault Ste. Marie, Ontario
P6A 5M6
Office: 705 254-7204
Mr. Erkki Kukkamaki

Birch-Hill Developments Ltd.
R.R. No. 1 MacLennan Rd.
Desbarats, Ontario
P0R 1E0
Office: 705 782-6743
Mr. Joseph Wiederekhr

Fulmer Construction Ltd.
P.O. Box 1643
Timmins, Ontario
P4N 7W8
Office: 705 267-5026
Mr. Don Fulmer

P.A. Hansen Const. Ltd.
328 Brenda Dr.
Sudbury, Ontario
P3E 5G7
Office: 705 522-5755
Mr. Paul A. Hansen

Robert Higgins Const. Ltd.
122 Dacey Rd.
Sault Ste. Marie, Ontario
P6A 5K9
Office: 705 949-2659
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